Contribution ID: **177** Type: **Talk**

Exploration of the phase diagram within a transport approach

Wednesday 15 June 2022 10:50 (20 minutes)

We present equilibrium as well as out-of-equilibrium properties of the strongly interacting QGP medium under extreme conditions of high temperature T and high baryon densities or baryon chemical potentials μ_B within a kinetic approach. We will explore first the thermodynamic and transport properties of the QGP close to equilibrium in the framework of effective models with $N_f = 3$ active quark flavours such as the Polyakov extended Nambu-Jona Lasinio (PNJL) [1] and dynamical quasiparticle model with the CEP (DQPM-CP) [2]. Considering the transport coefficients and the EoS of the QGP phase, we compare our results with various results from the literature. Moreover, we find a good agreement between resulting transport coefficients at $\mu_B = 0$ to the predictions from the lattice QCD and estimates from a Bayesian analysis by the JETSCAPE Collaboration.
Furthermore, out-of equilibrium properties of the QGP medium and in particular, the effect of a μ_B - dependence of thermodynamic and transport properties of the QGP are studied within the Parton-Hadron-String-Dynamics (PHSD) transport approach [3,4].
The PHSD covers the full evolution of the system during HICs, including the partonic phase as well as the phase transition between the hadronic and partonic phases, where the microscopic properties of quarks and gluons are described by the DQPM.
The DQPM, which is based on the lQCD data, interprets the EoS in terms of dynamical degrees of freedom and allows evaluating the cross sections of the corresponding elastic and inelastic reactions, which are essential for the transport evolution.
The microscopic properties of partonic quasiparticles and their differential cross sections depend not only on the temperature T but also on the chemical potential μ_B explicitly in these studies.

We find that bulk observables and flow coefficients for strange hadrons as well as for antiprotons are more sensitive to the properties of the QGP, in particular to the μ_B - dependence of QGP interactions.

[1] O. Soloveva, D. Fuseau, J. Aichelin and E. Bratkovskaya,
Phys. Rev. C **103** (2021) no.5, 054901

[2] O. Soloveva, J. Aichelin and E. Bratkovskaya,
Phys. Rev. D **105** (2022) no.5, 054011

[3] W. Cassing and E. L. Bratkovskaya,
Nucl. Phys. A **831** (2009), 215-242

[4] P. Moreau, O. Soloveva, L. Oliva, T. Song, W. Cassing and E. Bratkovskaya,
Phys. Rev. C **100** (2019) no.1, 014911

Present via

Offline

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Session Classification: PA-Bulk matter phenomena, QCD phase diagram, and Critical point

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